EXECUTIVE SECRETARIAT

ROUTING SLIP

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Remarks

STAT

Executive Secretary

6/6/84

Date

3637 (10-81)

6 June 1984

MEMORANDUM FOR: National Intelligence Officer for Science and Technology

FROM: Director of Central Intelligence

SUBJECT: Soviet R&D

1. I have underlined in this piece, "Can Soviet R&D Keep Up the Pace?", what seems to be two interesting compendiums of information on how Soviet science and technology works. You might look into their availability.

2. Also, The Wilson Center has scheduled on June 26 and 27 a two-day converence on the experience, current conditions and prospects of US-Soviet reciprocal exchange programs. See the last page of the attached flyer.

William J. Casey

Attachments:
The Wilson Center/June 1984 Reports
The Wilson Center/Calendar June 1984

25X1

CAN SOVIET R&D KEEP UP THE PACE?

Bits and pieces of valuable new information about Soviet science and technology have emerged over the last 15 years as small numbers of Soviet scientists and engineers have emigrated to the West. Their accounts of life inside the Soviet scientific establishment were put together for the first time recently in two projects just completed. One, conducted by Harvard, was based on interviews with several hundred émigré researchers. The other, a companion project that concluded its work in a February 24–25 conference at the Center's Kennan Institute, was MIT's Eyewitness Seminar series. Ten of its 11 sessions brought a leading émigré scientist together with American specialists in his field.

"Our goal," said seminar codirector Loren Graham in his summary of the project, "was to define the strengths and weaknesses of Soviet science and technology and to try to explain [them] in terms of the intellectual, political, and social characteristics of the Soviet Union." According to Mark Kuchment, codirector with Graham and a research associate at Harvard's Russian Research Center, the group wanted "to close the gap" between the way the Soviet R&D community is described in the official literature on the subject and the way it *really* is, and also "to bridge the cultural gap" between U.S. and Soviet practitioners.

Graham, a professor of the history of science at MIT and a former Kennan Institute fellow, noted that most of the eyewitnesses thought Soviet elementary and high-school education superior to that of the United States. Some felt this held true at the university level as well, particularly in mathematics and physics, two subjects in which Russia's strength predates the 1917 revolution. In other areas of fundamental or theoretical research, as well, what Western specialists call the "blackboard rule" is indeed in effect, Graham confirmed: "Soviet science is likely to be strong in any area where the main tools of research are a blackboard and chalk, and weak in areas requiring material support, sophisticated instrumentation, the most modern computers, or close contact with industry."

Another source of strength for Soviet science and technology, according to Graham, is that Soviet society "worships science." And he found the Soviet government's emphasis on continuity of research no less important. Scientists in leading institutions there, unlike many of their colleagues here, "feel free to embark on long-term projects without fear that their budgets will be eliminated before they can complete their work." Furthermore, Soviet planners are apt to select a few high-priority areas of research, both military and nonmilitary, and then to pump money and personnel into them. So far the approach has paid off in computers and biotechnology.

Some of these advantages, however, cut both ways. While continuity of research in a few concentrated areas, for example, may account for certain scientific advances, it also has a way of stifling innovation. Thus the Soviet eyewitnesses, accustomed to what MIT Research Associate Paul Josephson called "a follow-the-leader approach" to taking on research, were most surprised by their discovery that American R&D seemed to be driven by the pursuit of scientific issues that were "hot." The Americans found the Soviet system much less nimble. Scientific institutions are rarely eliminated. The bureaucracy is "often afraid of innovation," Graham explained, because innovation "undermines careers and leads to unsettling changes."

A further impediment to innovation, according to Graham, is the Soviet economic system, which provides no incentive for putting research results into production. As a result, the Soviet researcher seems content to publish his findings as ends in themselves. Thereafter, he often loses interest in the topic. His American counterpart, meanwhile, is wasting no time in either taking the next step in the research process or beginning to figure out how to apply his findings commercially.

"Ideology and the need for international competition *really do* impel [the Soviets] to continue to try to operate a world-class scientific establishment," Harley Balzer, a Georgetown University historian, concluded, but "if you did a cost-benefit analysis, you might well close it down."

Plaguing Soviet science and technology even more directly is the Soviet supply and distribution system. Émigrés who were interviewed said they waged an unending battle to obtain supplies, not just sophisticated equipment, but nuts, bolts, paper, simple reagents. It was not unusual, they said, to halt their research for several weeks just to get the materials they needed to carry on.

They reported that lines of scientific communication, too, were inadequate. Because Soviet scientific journals are slow to pick up Western discoveries and are censored, researchers in the USSR are always playing catch up with their colleagues in the West. In addition, said Bruce Parrott, professor of Soviet studies at the Johns Hopkins School of Advanced International Studies, the editorial boards of international scientific journals—so-called invisible colleges—include few Russians. Again, they must go without the exchange of information that is one of the hallmarks of Western scientific publication.

Perhaps most startling in this respect was Graham's observation that "Western scientists visiting the Soviet Union often find that a Soviet scientist working on a given topic in one institute does not know of the existence of another Soviet scientist working on the same topic in another institute in the same city. The foreigners often play the role of bringing the two researchers together."

A final strike against the Soviet scientific establishment is its growing anti-Semitism, according to a number of the émigrés, most of whom are Jewish. Graham predicted damage to the

Soviet Union's strongest academic subjects, math and physics, from the exclusion of Jews, but noted that "the depth of talent in these fields is so great that the damage can probably be tolerated by the Soviet authorities."

At least two conference participants were reluctant to generalize from the eyewitness accounts. One, Linda Lubrano, an American University Soviet-studies professor, termed the results of the interviews "description more than explanation." Are we looking at Soviet science or the international dimensions of science? she asked. Do the interviewees, all top-ranking Soviet scientists, represent rank-and-file scientists? Do they represent the émigré scientific community or the Soviet scientific community? Do the findings show that Soviet scientists hold the views of Soviet society at large?

Interpreting the results is equally difficult without "good history," insisted Mark Adams, professor of the history and sociology of science at the University of Pennsylvania. "Policy studies *must* be historical, because that's where other sets of options were decided on by other decision makers. . .*and* we know the consequences," he said. "How are we going to understand how they function this year if we don't know how they developed?" A large part of the answer, Adams suggested, lies in an examination of the contradiction embodied by Soviet "bureaucratic science"—the "inert" and regressive management of what is *by definition* both creative and progressive.

That bureaucracy—and Soviet society as a whole—will ultimately determine how quickly and successfully new computer technologies can be absorbed in the USSR, said Graham. While the Western world is becoming increasingly aware "that the most efficient use of computers for a great range of applications is based on decentralized systems," the Soviet leadership, for political reasons, can't allow that. A microcomputer or a word processor that is hooked up to a printer and issued the proper commands, after all, is a "potential printing press," he said. "Anyone who remembers how Soviet dissidents of the late sixties used to spend days painfully typing *samizdat* documents on typewriters stuffed with five or six carbon copies will understand the significance of the new technology."

Thus, the Soviets are likely to continue the requirement that computers, like photocopiers, be "institutionally housed and controlled," predicted Graham, who was quick to point out that computers aren't about to "undermine or destroy the Soviet system." But, he said, the Soviets will "pay a stiff price" for eschewing entrepreneurship, free access to information, and private ownership of technology, all of which make a culture receptive to computers and enable their use to spread. "The evidence so far seems to indicate that a wide-open, chaotic, competitive marketplace with a staggering variety of contenders is the best environment for producing ingenious computer programs," Graham noted. "The Soviet Union could not duplicate this environment without contradicting its most cherished economic principle, the elimination of private enterprise."

The policy implications of all this, Graham cautioned, are *not* that we should sell the Soviet Union short: When it comes to science and technology, the Soviets may not be "winners," but they're never far behind in a race that has no winners. We should rather "encourage the use of computers in our civilian economy," a sphere in which, according to Graham, "time is on the side of the West."

We must begin, he said, by "restraining the military technology [on both sides] that can so easily destroy us all, and on which the Soviet Union competes rather well." Then, Graham concluded, "the new civilian technology that is now penetrating to the lowest levels of Western societies, and on which the Soviet Union competes badly, will give the Western nations real advantages in modernizing and improving their societies."

THE WILSON CENTER / CALENDAR

SMITHSONIAN INSTITUTION BUILDING 1000 JEFFERSON DRIVE SW WASHINGTON DC 20560
202 357 2115

JUNE 1984

Monday, June 4 — Workshop*

"Cinema and Social Change in the Developing World: Africa, Latin America, Southeast Asia, South Asia"

Pat Aufderheide, freelance film critic and contributing editor, In These Times
Mbye Cham, Assistant Professor of African Studies, Howard University
Chidananda Dasgupta, Fellow, The Wilson Center; film critic, New Delhi
Luis Francia, poet, writer, critic, and film editor, Bridge Quarterly

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Tuesday, June 5 — Noon Discussion

"South Africa and Its Neighbors: Beyond Destabilization"

Robert Jaster, writer on southern African affairs; former Fellow, The Wilson Center

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Colloquium, 4pm to 6pm

"Public-Private Interests: Entrepreneurs and the State in 20th Century Mexico"

Roderic Ai Camp, Fellow, The Wilson Center; Professor of History, Pella College
Commentators: Aziz Hamzaoui, international consultant, Washington, D.C.; former Minister of State for Foreign Affairs, Tunisia; Richard Nuccio, Director, Latin American Program, Roosevelt Center for Policy Studies

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Wednesday, June 6 — Noon Discussion

"Foreign Trade: The Great Soviet Statistical Trap"

Igor Birman, Editor, Russia magazine

Colloquium, 4pm to 6pm

"Was There a German Question in Tsarist Russia?"

Ingeborg Fleischhauer, Kennan Institute Short-term Grantee; historian in Russian and German political thought, Bonn
Commentator: Jeremy Azrael, Council Member, Policy Planning Council, U.S. Department of State

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Tuesday-Wednesday, June 26-27 Conference*

"U.S.-Soviet Exchanges"

This conference will seek to assess the experience, current condition, and prospects of existing U.S.-Soviet reciprocal exchange programs that involve academic, professional, technical, and administrative specialists.

Thursday-Friday, June 28-29 Conference*

"The Evolution of American Environmental Politics"

*by invitation

Seating is limited and must be on a first-come, first-served basis.

It is suggested that events be confirmed on the day of the event by telephoning Louise Platt or Cynthia Ely, 357-2115.